

Implementation

Allowable operating distances

An ADM, MCDS, AIM, or ASIM may be placed as far from its associated data terminal as is consistent with EIA RS-232 lead specifications. This separation distance is not absorbed in the following information.

Single wire gauge

The allowable operating distances between the SL-1 peripheral equipment (DLC) and a data terminal/computer port or MCDS port when one wire gauge is used are as follows:

Cable	PIC outside	PVC inside (Type D)
22 AWG	4000 ft (1219 m)	4000 ft (1219 m) ¹ 3400 ft (1036 m) ²
24 AWG	3500 ft (1067 m)	2900 ft (884 m) ¹ 2000 ft (610 m) ² 1600 ft (488 m) ³
26 AWG	200 ft (610 m)	2000 ft (610 m) ¹ 1700 ft (518 m) ²
Note 1: QPC311E or higher vintage with QMT7C/D, QMT8A, QMT12A, MCDS		
Note 2: QPC311C/D with QMT7C/D, QMT8A, QMT12A, MCDS		
Note 3: QMT7D operating limitation with Northern Telecom cable		

Note 1: A co-located ADM may be installed up to 4000 ft (1200 m) from the DLC. This allows an end to end separation of 8000 ft (2400 m).

Note 2: In some instances, the above limitations may be exceeded with no adverse effect upon ADM, AIM, or MCDS operation.

Mixed wire gauge

In a mixed wire gauge application, the allowable equipment separation distance must be reduced in order to retain transmission quality. Average figures are as follows:

Cable	PIC outside	PVC inside (Type D)
22/24 AWG	2500 ft (762 m)	2500 ft (762 m) ¹ 2100 ft (640 m) ²
24/26AWG	1500 ft (457 m)	1500 ft (457 m) ¹ 1200 ft (366 m) ²
Note 1: QPC311E or higher vintage with QMT7C/D, QMT8A, QMT12A, MCDS		
Note 2: QPC311C/D with QMT7C/D, QMT8A, QMT12A, MCDS		
Note 3: QMT7D operating limitation with Northern Telecom cable		

Note 1: A co-located ADM may be installed up to 4000 ft (1200 m) from the DLC. This allows an end to end separation of 8000 ft (2400 m).

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AIM

An AIM may be placed as far from its associated AILC port as is consistent with EIA RS-422 lead specifications, which limits the distance to 4000 ft (1200 m).

Customers who use RPE can install ADM at remote locations as well as at the main location. This extends the range of all-digital data communications to approximately 100 km.

Cable specifications

Twisted wire pairs must be used for digital pairs, and no bridge taps are allowed. The crosstalk figure of cable used between the MDF and ADM measured at 64 kHz with 100 ohm termination must be

- near end crosstalk > 40 dB
- far end crosstalk > 40 dB

Strapping options are provided on the DLC and ADM for the selection of wire gauges applicable to the installation.

Modem pool configuration

The modem pool configuration provides internal data station access to shared dial-up modems for outgoing trunk calls and remote terminal access to local computer ports over a voice-grade network. The inbound modem pool is separate from the outbound modem pool. An ADM connected to the modem provides the DDN required for the receipt of incoming calls to the pooled modem.

Note: With AMP it is no longer necessary to maintain separate inbound and outbound modem pools.

The number of modems within a modem pool is determined according to traffic requirements for that modem pool (see *Meridian data features traffic engineering and configuration* (553-2731-151)), and several modem pools may be configured as required to meet the customer's application requirements.

Hardware requirements

This section describes the primary equipment items, excluding the SL-1 switch itself, required to implement the Meridian Data Services feature.

One ADM, or AIM, or ASIM, or MCDS-AC is required to interface with each data device supplied by the customer.

ADM

In the co-located mode, the ADM operates in conjunction with an SL-1 telephone to provide the interface with data terminal equipment in cases where

- both voice and data calling are required
- answer-and-originate data calling capabilities are required

In stand-alone mode (no companion SL-1 telephone), the ADM supports incoming data calls where no voice calling or data-call originating capabilities are required (for example, computer ports and modems).

AIM

The AIM and its associated AILC port supports all types of outgoing and incoming data calls where no voice calling or data-call originating capabilities are required (for example, computer ports and modems).

ASIM

The ASIM supports all types of asynchronous and synchronous outgoing and incoming data calls. Either keyboard or keypad dialing is used to establish the asynchronous outgoing connections while only keypad dialing may be used to establish synchronous outgoing connection.

Power supply

Power for each module is supplied externally as follows:

- One external power unit is required to provide local 24 V input to each ADM or AIM. A 110 or 220 V ac to 24 V transformer must be used. Use a P0593922 or P0610756 24 V transformer for the ADM. The A0290050 24 V transformer is recommended for use with the AIM.
- One external power supply (A0297998) is required for each ASIM. A 110 V ac input service should be used. An optional 220 V power supply (A0318291) is available for the international market. The ASIM power supplies are assembled with the units and it is not necessary to order them separately.

DLC

The QPC311 DLC supports SL-1 sets, ADM and ASIM in the following operating combinations:

- two independent telephone and two stand-alone ADMs
- two co-located telephone/ADM pairs
- one co-located telephone/ADM pair plus one independent SL-1 set and one stand-alone ADM
- two ASIM plus two SL-1 sets

The QPC432 4PDLC supports four ASIM or four ports of MCDS-AC.

AILC

The QPC430 AILC supports four AIM or equivalent units. It combines the basic functions of four ADM and provides the drivers and receivers to meet standard EIA RS-422 electrical interface specifications.

Modem Pool Line Card (asynchronous outbound only)

Each customer-supplied asynchronous outbound pooled modem requires interface, on the analog side, with one port of an MPLC. This provides the modem VFDN. One MPLC supports up to four modem pool VFDN. (The MPLC cannot be used for 500 or 2500 type set terminations.) The 500-set line card is used for inbound modem pools and for synchronous modem pools.

Note: The MPLC and the VFDN are not used with the AMP feature.

Multi-Channel Data System

The MCDS-AC port may be used instead of ADM to interface multiple ports of a computer. An MCDS-AC port is required to interface each computer port to the equipment using a DLC.

Major equipment items required to implement MCDS consist of

- MCDS shelf
- DLC
- MCDS-AC
- MCDS power supply unit
- MCDS cabinet (optional)
- Spectron patch panel and cables (optional)

MCDS cabinet

Two different enclosures are available:

- A large cabinet (varying sizes and configurations) that can accommodate two shelves and four patch panels
- A smaller cabinet that accommodates one shelf only

MCDS shelf

The MCDS shelf houses a center-mounted power supply and four asynchronous cards mounted on each side of the power supply (a total of eight). It can be either a stand-alone unit on an equipment frame or mount in the MCDS cabinet.

MCDS power supply

The MCDS power supply is an off-line, switched mode supply which provides multiple, regulated, and protected DC voltage to the shelf backplane. It requires 1.7 amp from a 120 V, 60 Hz ac source. It supplies steady-state 140 watts multiple, regulated, and protected DC voltage to the backplane. An optional MCDS power supply is available that connects to 220 V, 50 Hz ac lines.

MCDS backplane

The MCDS backplane, which is part of the shelf assembly, is provided with two-sided circuitry. It is equipped with nine 160-pin connectors to receive the interface and power supply circuit packs. It is also equipped with two 25-pair standard telecom-type plugs to connect to the SL-1 switch and 32 female-type, standard 25-pin, RS-232-C connectors to provide interface to the computer ports. The backplane is also provided with an insulator sheet on the rear surface to prevent accidental shorting of the traces with metal connector hoods.

MCDS-AC

The MCDS-AC provides the drivers and receivers to meet the EIA standard RS-232-C electrical interface specifications.

Traffic measurements

Traffic measurements provided for data traffic and feature usage for data calls are the same as for voice traffic from telephones. Refer to *Traffic measurement formats and output* (553-2001-450) for further information on available traffic measurement.

Memory and real time requirements

Implementation of the SL-1 data feature requires additional memory for each ADM added. Requirements for unprotected and protected data store and real time are given in *Meridian data features traffic engineering and configuration* (553-2731-151).

Maintenance and testing

A manual remote loopback testing capability is provided for isolating ADM and ASIM faults. Information on remote loopback testing procedures is given in *Meridian data features operation and tests* (553-2731-300).

All resident maintenance programs, maintenance overlays, and diagnostics which apply to telephones and line cards are also applicable to the ADM, AIM, ASIM, and AC ports, DLC, AILC, and MPLC.

Administration

The Meridian 1 recognizes the ADM, AIM, ASIM, or MCDS-AC port as a telephone; the DLC, 4PDLC, or AILC as an SL-1 line card; and the MPLC as a 500-type line card. LD 10 and LD 11 are used to enter the parameters for data hardware in the SL-1's office memory.

ADM/ASIM	LD 11
MCDS-AC	LD 11
DLC/4PDLC	LD 11
AILC	LD 11
MPLC	LD 10
VFDN	LD 10

The optional AMP and associated features require modifications to the following programs to enter data into memory.

AMP	LD 16
Dataport Hunting and Modem TN	LD 14
DTI Default Flag	LD 11
DTI Default Prefix	LD 15

Meridian 1
Meridian Data Services
Description

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